

MODERN TRENDS IN PENSION SYSTEMS DECISION MAKING

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1. Introduction

Many countries in the world are facing an existing or looming pension crisis. There could not be a more opportune moment to launch a new series of books on pensions. Countries around the globe are fast waking up to the fact that they have a major challenge on their hands with their state-run pension schemes. The combination of a rapidly changing population and fertility rates well below replacement rates has led to a striking increase in the dependency ratios in many countries. At the same time, many private sector schemes are facing severe funding difficulties as a result of poor stock market returns, falling interest rates and increasing longevity.

For individuals, society, and government, the main objectives of any pension system are to: smooth consumption over lifetime; provide insurance against longevity risk, inflation risk, and other risks; redistribute income; and alleviate poverty. However, these have to be traded off against economic growth; labour market efficiency and flexibility; and against other needs like health, education, and infrastructure. Individual, fiscal, and societal affordability should be kept in mind in designing pension systems. Benefits must thus evolve over time as affordability grows [1, p.40].

A central theme of the actual debate consists in the respective roles of the state and the private sector in organizing pension's provision in the future, and this is the theme of this article. That is why the main objective of the paper is to describe pension plans and pension systems' reforms in order to analyze their consequences for now and long-term future. The problems that have motivated pension reform across the globe are real, and reforms are needed. In principle, the approach delineated in *Averting the Old Age Crisis* is expansive enough to reflect any potential combination of policy responses to the pension reform challenge. But in practice, the "World Bank model" has been interpreted as involving one specific constellation of pension pillars: a publicly managed, pay-as-you-go, defined benefit pillar; a privately managed, mandatory, defined contribution pillar; and a voluntary private pillar. It is precisely the private, mandatory, defined contribution component that we wish to explore in this paper.

In section 2 and 3 we briefly describe pensions from an economic point of view, and define what is meant by a public and a private pension scheme, analyze its risks. This is essential for the sequel of the paper, and to understand the ongoing debate in pension decision making. This paper strengthens the view that the best way to finance a generous pension system without overloading the working generation is to accelerate the growth, notably investing in technology, infrastructures, and the formation of human capital. However, in an aging society, workers in activity should accept to renounce to a large share of the output they produce, and pensioners should acknowledge that their purchasing power cannot grow at the same pace of output [2, p.18].

2. Types of pension schemes

It is worth making the point at the outset that pensions and retirement are inventions of the late nineteenth and early twentieth centuries in developed economies. Before this, people in what are now developed economies did not retire; they continued working until they dropped, often ending their lives in the 'poor house'. Bismarck created the world's first state pension system in Germany in the 1880s. During the twentieth century, state and occupational pension schemes developed in the other countries of Europe and in developed economies as far apart as the USA and Australia. However, in many parts of Africa, Asia and Latin America, even today the idea of retirement and

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pensions remains a dream.

The critical decision on pension funding arose after the Great Depression. While the stock market crash of 1929 hit the moneyed classes, the depression led to corporate insolvencies and massive unemployment, leading to the establishment of major social programs. Mandatory universal pension systems were established in most developed countries between the late 1930s and the early 1950s [3, p.18].

It is conventional to talk of three pillars of support in old age for people, which live in developed countries. The first pillar is provided by the state as part of its social security system.

There are two main types of social security system: Beveridgean and Bismarckian.

A Beveridgean system provides just sufficient support to keep people off the breadline; if people want to enjoy a higher standard of living, they are expected to make their own alternative arrangements. The UK and USA have Beveridgean social security systems.

A Bismarckian system provides much more generous support, often at a level that does not require individuals to make additional arrangements. Germany, Italy and France have Bismarckian social security systems. The first pillar is financed by collecting tax (part of the social security tax that the government raises) from workers and paying it out immediately to pensioners. In other words, it is known as an unfunded system, since no fund of pension assets is accumulated. Clearly the level of social security tax collected will be lower in the former than the latter systems.

A pension scheme is a mechanism for providing retired people with annuities, and for allowing those of working age to build up entitlements to an annuity when they retire. Pension schemes can be provided publicly, by national governments, or privately, by employers, insurance companies and other commercial organisations. Without pension schemes, the only way workers could make provision for their old age would be by deferring consumption of part of their income until they retired – i.e. by saving for retirement [4, p.6].

Pensions can be arranged in different ways, relating to:

- the way they are organized;
- the relation between contributions and benefits.

In a fully funded scheme, pensions are paid out of a fund built over a period of years from its members' contributions. With pay-as-you-go (PAYG) schemes, in contrast, pensions are paid out of current income. While we describe the polar cases, partial funding represents a continuum between them.

Fully funded schemes are based on savings — contributions are invested in financial (or possibly physical) assets, the return on which is credited to the scheme's fund. Funding is thus a method of accumulating financial assets, which are exchanged for goods at some later date. While fully funded schemes can take many forms, in principle they always have sufficient reserves to pay all outstanding financial liabilities (or, equivalently, liabilities are defined by available funds).

If there is no redistribution across generations, a generation is constrained by its own past savings and a representative individual gets out of a funded scheme no more than he has put in. If, in addition, there is no direct redistribution across individuals, when an individual retires, the pension fund will be holding his past contributions, together with the interest and dividends earned on them. This accumulation finances the person's consumption in retirement, through an annuity or in some other way [5, p.392-394].

PAYG schemes are usually run by the state. They are contractarian in nature, based on the fact that

the state can, but does not have to, accumulate assets in anticipation of future pension claims, but can tax the working population to pay the pensions of the retired generation.

Most state pension schemes are primarily PAYG.

From an economic viewpoint, PAYG can be looked at in several ways. As an individual contributor, a worker's claim to a pension is based on a promise from the state that, if he pays contributions now, he will be given a pension in the future. The terms of the promise are fairly precise, being set out in each country's social security legislation (although subject to legislative change).

From an aggregate viewpoint, the state is simply taxing one group of individuals and transferring the revenues to another, whether viewed on an annual or a lifetime basis. State-run PAYG schemes, from this macroeconomic perspective, are little different from other income transfers, although the determinants of who pays and who receives and the incentive structure can be very different from other income transfer systems.

A major implication of a PAYG system is that it relaxes the constraint that the benefits received by any generation must be matched by its own contributions. Samuelson (1958) showed that with a PAYG scheme it is possible in principle for every generation to receive more in pensions than it paid in contributions, provided that the rate of growth of total real earnings exceeds the interest rate indefinitely; this can happen when there is technological progress and/or steady population growth and excessive capital accumulation (Aaron, 1966). Since this does not appear to be empirically relevant over the longer term, the real role of PAYG is to redistribute across generations and to share risks across generations [6, p.18]. Whether funded or PAYG, a separate question is how closely pension benefits are related to a worker's previous contributions. Three approaches are common: Defined-contribution schemes, Defined-benefit schemes, Notional defined-contribution schemes.

Most European pension systems are founded on three pillars: public schemes (so-called "Social Security" programs), occupational schemes (i.e., employer pensions), and individual pension plans that highlight the need for personal saving. Each pillar has advantages and drawbacks in terms of the provision of support, and not all three pillars are well established in all Member States. That said, the public programs tend to be of central importance in that they make up the lion's share of income for most European pensioners [7, p.10].

Most first pillar schemes are (non-financial) defined benefit in nature. Recently, countries such as Sweden and Poland have experimented with non-financial (or notional) defined contribution (NDC) schemes for their first pillar (Holzmann and Palmer, 2006). These are unfunded schemes in which members have individual defined contribution (DC) accounts in which the returns that are credited to the contributions are not related to the returns on financial assets, but to some non-financial variable, such as the growth rate in the country's GDP or the growth rate in national average earnings (denoted "g" below).

The contribution rate is a fixed proportion of earnings. At retirement, the notional capital in the member's account is converted to a life annuity, using an annuity factor that reflects both the cohort life expectancy of the member and the rate of return on the scheme over the expected term of the annuity.

The system is kept in financial balance to ensure that the present value of system assets (PV(A)), i.e., the accruing notional capital, always equals the present value of system liabilities (PV(L)), i.e., the expected pension payments.

This is achieved by using an adjusted rate of return.

$$\text{where, } \rho = [(PV(A)/PV(L)) - 1], \quad g + \rho, \quad (1)$$

The effects of demographic and economic shocks are therefore accommodated endogenously within the scheme and within each cohort, since the credited return on the scheme, $g + \rho$, adjusts the member's notional capital during both the accrual and payment stages and the annuity paid at retirement reflects changes in birth cohort life expectancy.

NDC schemes therefore have four properties:

- at any time, the present value of an individual's lifetime benefit equals the individual's account balance;
- to maintain a fixed contribution rate, total NDC system assets must equal or be greater than total liabilities;
- the NDC benefit is constructed as a life annuity, reflecting life expectancy at retirement;
- financial balance requires the accounts be valued at the rate $g + \rho$.

NDC schemes can be interpreted as exhibiting intergenerational fairness, since each generation pays the same contribution rate as a proportion of earnings and receives a pension based on its own economic performance over its lifecycle and its own mortality prospects.

The second pillar is provided by the companies in the form of occupational pension schemes or plans. Companies are said to sponsor such schemes. Typically, occupational pension schemes are funded, i.e., a fund of pension assets accrues from the contributions or premiums paid by the employer (the scheme sponsor) and worker (the scheme member) and from the investment returns on these contributions. The pension is paid from the accrued fund once the member retires. Sometimes (and this is more common in smaller companies than larger companies), the accrued fund is given to a life assurance company which then provides a life annuity to the retiree.

There are three classes of pension scheme member: the active member, who still works for the company and is still making contributions; the retired member, who has retired from the company and is drawing a pension; and the deferred member, a worker who is no longer working for the company and has not yet retired, but has accrued rights to a pension on the basis of his previous service for the firm and associated membership of the scheme – the pension then becomes payable when the deferred member retires from his last job.

Although most occupational pension schemes are funded, the calculation of the pension benefits can differ widely between different types of scheme. There are three main types of occupational scheme: defined benefit (DB), defined contribution (DC) and hybrid.

Until recently, the most common type of scheme was a DB scheme. In such a scheme it is the benefit that is defined and the scheme promises to pay a pension, based on this defined benefit, whatever the size of the fund backing this promise. The simplest DB scheme offers a fixed monetary pension at retirement, irrespective of earnings or subsequent inflation. Such schemes are common in Germany and the USA (where they are known as fixed benefit or fixed amount plans).

Increasingly, DB schemes are being replaced with DC schemes. In such schemes, it is the rate of contributions into the scheme that is defined. The contributions might be a fixed annual amount or they might be a fixed percentage of salary. The pension will depend on the value of the fund accrued by the time of retirement. No particular level of pension is promised with a DC scheme.

If the value of the fund is low, either as a result of low contributions or poor investment performance, then the pension will be low as well.

If, on the other hand, the value of the pension is high, the pension will be correspondingly high. By definition, DC schemes show neither surpluses nor deficits [7, p.8].

Hybrid schemes have a mixture of DB and DC components. The main examples are as follows (Wesbroom and Reay, 2005):

- Sequential hybrid scheme. The scheme might have a DC element (commonly called a nursery DC scheme) for those below a certain age (e.g., 45) and a DB element for those above it. Such a scheme offers good portability for younger workers who tend to be more mobile and a more predictable pension for older workers.
- Combination hybrid scheme. The scheme offers a DB pension in relation to salary up to a limit (which might be the basic salary) and a DC pension in respect of salary above this limit (which might be the variable element of salary).
- Underpinning arrangements. There are two main types. The first is a DC scheme with a DB underpin. Such a scheme provides a minimum pension, based on what a corresponding DB scheme with the same salary experience and service would have paid, in case the investment performance is very poor. The second is a DB scheme with a DC underpin. This type of scheme is intended to provide a ‘value-for-money’ guarantee for early leavers. The value of the final salary benefit is guaranteed not to be less than a DC benefit calculated on the basis of a multiple of the member’s contributions accumulated with interest.
- Cash balance scheme. This is a defined benefit scheme in which the benefit is defined as an individual account within the scheme. The scheme specifies the rate of contribution and the rate of investment return (independent of the performance of the underlying assets in the scheme, but typically linked to the return on bonds) that will be credited to the member’s account. The accumulated lump sum at retirement is used to buy an annuity. To the member, a cash balance scheme resembles a DC scheme. It is the most common hybrid arrangement in the USA. It is also sometimes known as a shared risk scheme.
- Targeted benefit scheme. This is a DC scheme but the aim is to deliver a target pension, so the contributions will have to be adjusted over time if the fund falls short of or exceeds the target.

The OECD classification from the pension fund’s/provider’s perspective applies to personal pension plans and occupational defined contribution pension plans (fig. 1).

Unprotected pension plan: a plan (personal pension plan or occupational defined contribution pension plan) where the pension plan/fund itself or the pension provider does not offer any investment return or benefit guarantees or promises covering the whole plan/fund.

Protected pension plan is a plan (personal pension plan or occupational defined contribution pension plan) other than an unprotected pension plan. The guarantees or promises may be offered by the pension plan/fund itself or the plan provider (e.g. deferred annuity, guaranteed rate of return) [8, p.14].

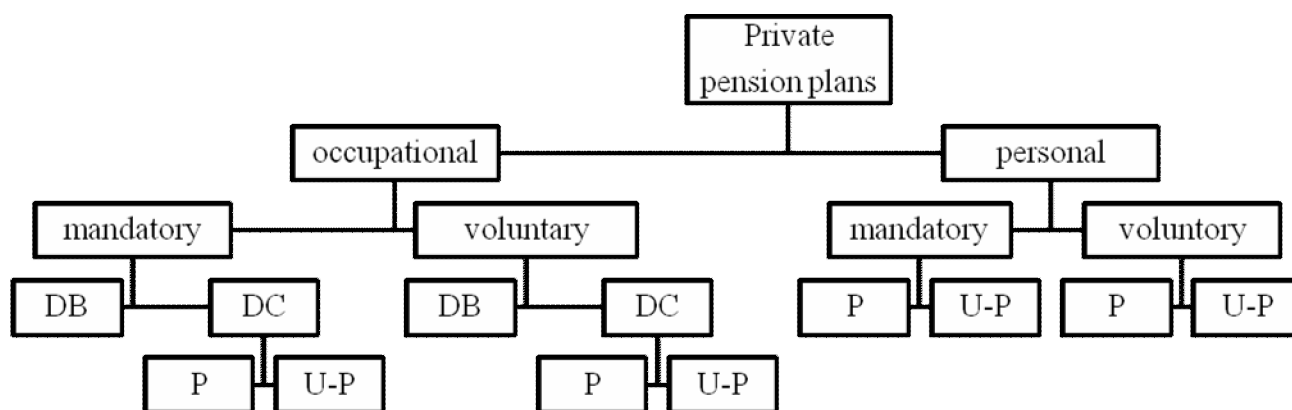


Fig.1. Private pension plan classification: functional perspective

The third pillar is any additional savings for retirement that the individual chooses above that provided by the state or the company for whom the individual works. These savings will typically be held in deposit accounts or in mutual funds invested in equities or bonds.

If the individual chooses to do this via a formal pension scheme, it will almost invariably be in the form of a DC scheme, known as a personal pension scheme or an individual retirement account. Other assets can also be used to provide income in retirement. The best example of this is the domestic home. When they retire, individuals sometimes sell their home and buy a smaller one in order to increase their spending power in retirement; this is known as trading down [9, p. 25-26].

Increasingly there is a fourth pillar of support in old age, and that is post-retirement work. Sometimes this is by choice. Some individuals do not like the idea of being fully employed one day and then having no work to do the next. Such individuals prefer a gradual entry into retirement. For other individuals, there might be no choice but to take a part-time job to make ends meet.

3. Risks in pension schemes and the potential policy options

As for any financial contract, pension contracts have to deal with several sources of risk. Therefore, it is crucial to evaluate the effects of different pension schemes on the distribution of risk. In particular, who will bear the risk of longevity and earning losses (due to job loss or to different wage dynamics over his working life). In principle, the risk should be mostly transferred to the agent who has the lowest risk aversion: if the private fund, say, managed by an insurance company is risk-neutral with respect to the specific risks considered, it is efficient that it bears all risk. It should be mentioned that pension schemes face large risks that are hard to predict:

- macroeconomic shocks affect output, prices, or both;
- demographic shocks affect all pension schemes, by affecting market prices and quantities and pension claims;
- political risks affect all pension schemes because all depend critically – albeit in different ways on effective government;
- management risk can arise through incompetence or fraud, which imperfectly informed consumers generally cannot monitor effectively;
- investment risk: private and public pension accumulations held in the stock market until retirement is vulnerable to market fluctuations;
- annuities market risk: for a given pension accumulation, the value of an annuity depends on remaining life expectancy and on the rate of return the insurance company can expect over those years (and is thus also a form of investment risk) [5, p.401-403].

Uncertainty is also more pronounced with private pension contracts. Sticking with mandatory pensions, what we called management risk is, for many individuals, management uncertainty. As the Swedish recent experience taught it is difficult for employed workers to evaluate a wide menu of different pension products just because they are not able to evaluate their uncertain characteristics.

For pensions this problem is even more dramatic than for other financial assets, because pension schemes are highly illiquid assets; and pension subscribers have often no previous experience of this type of financial instrument, and will only build up one much later in life, possibly, at retirement.

We have analyzed different policy options considering differences in pension schemes. It demonstrates that there is no one-type solution for every country.

First of all, mainly, governments should focus on economic growth and invest more on human and physical capital to increase productivity and so output. International level human and capital planning can be an option in medium and long term perspective.

In addition, an optimum mix of lower benefits, increased contributions and later retirement can be implemented. Especially, state pension age should rise gradually and implemented flexibly. It should be supported with labour market developments. This option eliminates the additional risks and costs of relatively radical reforms such as funded pension schemes, of which success depends on satisfaction of some preconditions.

Pension systems have many objectives, but pure funding schemes are not capable of responding all objectives at the same time. Private individual accounts cannot insure properly all related risks. It is clear that even in the most developed countries, stock markets prone to high risks and these risks are crucial threats for the 'insurance' function of state pensions. Moreover, pension systems should concern poor and vulnerable people and ensure a reasonable level of life quality for their retirements.

So, redistribution function of a pension system is very important [4, p.28-30]. Thus, moving to mixed type pension schemes can be a good option when the required conditions for individual accounts are met. 'Three-pillar' approach emphasizes different aspects a good mixed type pension scheme. As a first tier, a mandatory publicly managed PAYG pillar is essential for different purposes of pension schemes. It can be supported with mandatory membership of privately managed funded pension in second tier and voluntary contributions to funded pensions in third tier [9, p.3-4]. However, weights of each tier depend on conditions of specific countries.

Finally, funded schemes should be supported by government to achieve all the objectives of pensions. Governments need high regulatory capacities to protect the consumers against uncertainties that they cannot manage by themselves by effectively regulating markets and easing the information processing in funded scheme pillars. As in the case of Sweden and UK, centralizing the administration of funded schemes can also decrease the costs to reasonable levels. Applying automatic enrolment to pension saving schemes can increase the participation level for third tier. While respecting people's freedom of choice by providing some individual account options, limiting the number can minimize the effect of information processing problem.

Notional defined-contribution (NDC) which is actually a PAYG system, but has actuarial characteristics can be alternative to funded schemes [8, p.10]. NDC is not prone to financial market risks like the funded schemes and also high transition and administrative costs of funded schemes can be abolished. However, one should not forget that NDC like funded schemes does not respond demographic pressure but brings discipline and equilibrium between revenue and expenses of pensions.

Though the increased role of supplementary pension funds and the recent economic and financial downturn have led to new challenges in relation to both the future financial sustainability and the adequacy of pensions, pension reforms have not entailed a 'residualisation' of the state role in the field or the passive privatisation of pension policy [10, p. 67-69].

On the contrary, both state and social partners have a key role to play in the management and regulation of pension funds.

The paper has stressed key dimensions of the complex public/private mix in pensions policy and has drawn attention to aspects such as the rules affecting the setting up of private pensions; the supervision and monitoring functions; the tax rules; investment and information; participation/contribution to the funds; their management; the participation to financial costs and guarantees; and the competition between funds, all of which represent dimensions where new form of public/private interaction may be implemented.

4. Conclusions

Changes in demographic parameters threaten the sustainability of state pensions in the long run. Economically there are many options for the solution of the problem. However, optimality and feasibility of any reform options depend on many factors. When all the factors are taken into account, it is not easy to say that funded pension is superior to PAYG and cope with demographic pressure better.

Debate between PAYG and funding is not a central question addressing the population aging. A good pension system can be in different forms depending on political response to weighting different objectives of pension systems and country-specific conditions. Ultimate response to demographic pressure requires stable and high economic growth and effective government in any pension systems. At the same time, different types of pension schemes involve different types of risk and different ways of sharing those risks. As a consequence, there will be different types of redistribution of resources within the different schemes.

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Summary

This paper sets out the economic analytics of modern pension systems and its components. After introductory discussion, successive sections consider the effects of different pension arrangements on labour markets, on the distribution of burdens and benefits. These areas are controversial and politically highly salient. The relevance of the article is caused by the crisis in government pension system in many developed countries, due to not only the demographic factors, but to the challenges of the global economic and financial crisis. The objective of this paper is to define what is meant by a public and a private pension scheme, analyze its risks and overview the options of the further pension systems' development.

Keywords: pension scheme; private pension plans classification; risks; reforms.

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